



FEATURES

- ◆Wide 2:1 DC input range
- ◆In/out capacitance1000pF
- ◆Protections : Short circuit / Overload / Over voltage
- ◆1500VDC I/O isolation for D/D
- ◆Cooling by free air convection
- ◆Built-in remote ON-OFF control
- ◆100% full load burn-in test
- ◆Fixed switching frequency at 225KHz
- ◆Lost cost
- ◆MTBF>1000Khours
- ◆High reliability and compatibility
- ◆3 year warranty

MODEL SELECTION

WRB^①24^②12^③Y^④QD^⑤-40W(3334)^⑥

- ①Product Series ②Input Voltage
③Output Voltage ④Wide (2:1) Input Range
⑤2"×2"DIP Package Style
⑥Rated Power(Output current)

APPLICATIONS

The WRA(B)-YQD-40W Series of DC/DC converters has been designed for a wide range of applications including communications, industrial systems and battery powered mobile equipments. Key features are high power density and 2:1 wide input ranges of 18~36 VDC and 36~72 VDC.(But also can do high power density and 4:1 ultrawide input ranges of 9~36 VDC and 18~72 VDC.)



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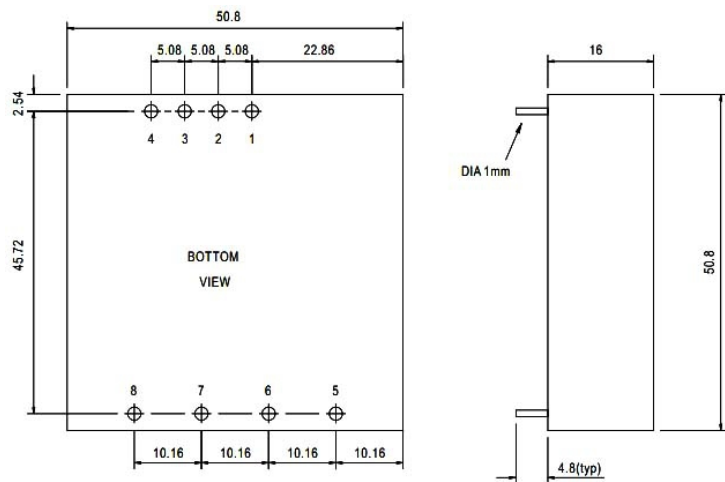
SELECTION GUIDE

Order code	Input voltage range (VDC)	Output voltage (VDC)	Output current max.(mA)	Efficiency typ.(%)
WRA1205YQD-40W	9~18	±5	±4000	78
WRA1212YQD-40W	9~18	±12	±1667	82
WRA1215YQD-40W	9~18	±15	±1334	80
WRA1224YQD-40W	9~18	±24	±834	83
WRA2405YQD-40W	18~36	±5	±4000	79
WRA2412YQD-36W	18~36	±12	±1500	86
WRA2412YQD-40W	18~36	±12	±1667	82
WRA2415YQD-40W	18~36	±15	±1334	83
WRA2424YQD-40W	18~36	±24	±834	78
WRA4805YQD-40W	36~72	±5	±4000	80
WRA4812YQD-40W	36~72	±12	±1667	84
WRA4815YQD-40W	36~72	±15	±1334	85
WRA4824YQD-40W	36~72	±24	±834	78
WRB1205YQD-40W	9~18	5	8000	79
WRB1212YQD-40W	9~18	12	3334	80
WRB1215YQD-40W	9~18	15	2666	80
WRB1224YQD-40W	9~18	24	1667	85
WRB2405YQD-40W	18~36	5	8000	82
WRB2412YQD-36W	18~36	12	3000	87
WRB2412YQD-40W	18~36	12	3334	82
WRB2415YQD-40W	18~36	15	2666	83
WRB2424YQD-40W	18~36	24	1667	78
WRB4805YQD-40W	36~72	5	8000	80
WRB4812YQD-40W	36~72	12	3334	84
WRB4815YQD-40W	36~72	15	2666	85
WRB4824YQD-40W	36~72	24	1667	79

SPECIFICATION

OUTPUT	Ripple&Noise(max.) (Note.2)		100mVp-p
	Line Regulation (Note.3)		±0.5%
	Load Regulation (Note.4)		±0.5%
PROTECTION	Overload	Above 105% rated output power	
		Protection type : Over power limiting, recovers automatically after fault condition is removed	
	Over Voltage	XX03 :3.8~4.95V	XX05 :5.75 ~ 7.5V
		XX12:13.8 ~ 18V	XX15:17.25 ~ 22.5V
		Protection type : Shut off o/p voltage, clamping by zener diode	
Short Circuit	Protection type : Constant current limiting, recovers automatically after fault condition is removed		
FUNCTION	ON/OFF Control	Power on: CTRL ~Vin > 4.5~5.5VDC or open Power off : CTRL~ -Vin <0.8VDC or short	
ENVIRONMENT	Working Temp.	-25℃~-85℃ (Refer to output load derating curve)	
	Storage Temp.,Humidity	-25℃~-85℃, 0~95% RH	
	Temp. Coefficient	±0.03%/℃ (-50~50℃)	
SAFETY&EMC (Note 5)	Safety Standards	Design refer to LVD	
	Isolation Voltage	I/P-O/P:1.5KVDC	
	Isolation Resistance	I/P-O/P:100M Ohms/500VDC	
OTHERS	MTBF	280.4K hrs min.	MIL-HDBK-217F (25℃)
	Dimension	50.8×50.8×16mm (2"×2"×0.63") (L×W×H)	
	Packing	110g;150pcs/15.8Kg/0.97CUFT	
NOTE	1. All parameters are specified at normal input, rated load, 2570% RH ambient. 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. 3.Line regulation is measured from low line to high line at rated load. 4.Load regulation is measured from 10% to 100%rated load 5. Please prevent the converter from operating in overload or short circuit condition for more than 30 seconds.		

Mechanical Specification



Unit:mm Pin section tolerances:±0.10mm General tolerances:±0.25mm

SINGLE OUTPUT(WRB-YQD-40W)

Pin	Assignment	Pin	Assignment
1	+Vin	6	+Vout
2	-Vin	7	-Vout
3,5	No pin	8	Trim
4	CTRL (ON/OFF)		

DUAL OUTPUT(WRA-YQD-40W)

Pin	Assignment	Pin	Assignment
1	+Vin	5	+Vout
2	-Vin	6	Common
3	No pin	7	-Vout
4	CTRL (ON/OFF)	8	Trim

APPLICATION NOTE

Requirement on output load

In order to ensure the product operate efficiently and reliably, in addition to a max load (namely full load), a minimum load is specified for this kind of DC/DC converter. Make sure the specified range of input voltage is not exceeded, the minimum output load no less than 10% load. If the actual load is less than the specified minimum load, the output ripple may increase sharply while its efficiency and reliability will reduce greatly. If the actual output power is very small, please add an appropriate resistor as extra loading, or contact our company for other lower output power products.

Recommended Circuit

All the WR-YQD-40W Series have been tested according to the following recommended testing circuit before leaving factory. This series should be tested under load (see Figure 1).

If you want to further decrease the input/output ripple, you can increase capacitance properly or choose capacitors with low ESR. However, the capacitance of the output filter capacitor must be proper. If the capacitance is too big, a startup problem might arise. For every channel of output, provided the safe and reliable operation is ensured, the greatest capacitance of its filter capacitor sees (Table 1). General:

$$\begin{aligned} C_{in} &= 10\mu F - 47\mu F \\ C_{out} &= 10\mu F / 100mA \end{aligned}$$

CTRL Terminal

When open or high impedance, the converter work well; When this pin is 'high', the converter shutdown; It should be note that the input current (I_c) should be between 5-10mA, exceeding the maximum 20mA will cause permanence damage to the converter.

The value of R Can be derived as follows :

$$R = \frac{V_C - V_D - 1.0}{I_c}$$

Input current

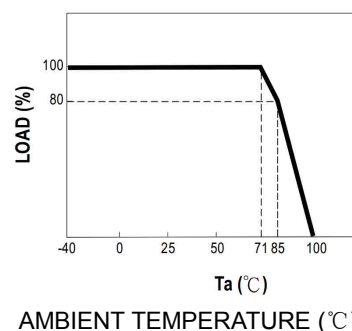
While using unstable power source, please ensure the output voltage and ripple voltage do not exceed indexes of the converter. The preceding power source must be able to provide for converter sufficient starting current I_p .

General: $I_p \leq 1.6 \cdot I_{in-max}$

No parallel connection or plug and play

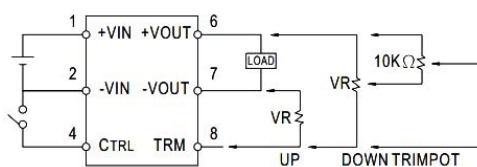
TYPICAL CHARACTERISTICS

Temperature Derating Graph



AMBIENT TEMPERATURE (°C)

External Output Trimming



ON/OFF Control Pin

CONTROL INPUT.....PIN4
 CONTROL COMMON.....PIN2
 LOGIC COMPATIBILITY.....CMOS OR OPEN COLLECTOR TTL
CONTROL VOLTAGE
 ON.....+5.5VDC min OR OPEN CIRCUIT
 OFF.....+2.5VDC max. OR SHORT TO PIN2

The diagram illustrates the power supply architecture. It begins with an 'I/P' (Input) terminal connected to an 'EMI FILTER'. The output of the EMI filter goes to the 'POWER SWITCHING' block. A feedback path from the output is taken before the rectifier and passes through an 'O.L.P.' (Over Load Protection) block to the 'PWM CONTROL' block. The 'PWM CONTROL' block also receives a 'CTRL' (Control) input. The output of the power switching stage is connected to a transformer, which then feeds into the 'RECTIFIERS & FILTER' block. The output of this block provides the '+V' and '-V' rails. A 'TRM' (Trim) input is connected to the positive rail. An 'O.V.P.' (Over Voltage Protection) block is connected to both the +V and -V rails and provides feedback to the 'PWM CONTROL' block. A 'DETECTION CIRCUIT' is also connected to the output rails and provides feedback to the 'PWM CONTROL' block.

FOSC:225KHz

Diameter:1.00mm(0.039inch)

Technical drawing of a stepped profile. The drawing shows a cross-section with the following dimensions:

- Overall width: 53.00 [2.087]
- Overall height: 18.20 [0.717]
- Top flange thickness: 11.60 [0.457]
- Bottom flange thickness: 0.60 [0.024]
- Bottom flange width: 11.30 [0.445]

A vertical dashed red line indicates the center of the profile.

L=230mm[9.055inch] Tube Quantity: 7pcs